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This grant supported an attempt to observe faint comets in the vicinity of the sun during the total eclipse of November 12, 1966. After two months' preparation, three fixed-focus K-37 aerial cameras were flown aboard an Air Force NC-135 jet which remained in the moon's shadow for 204 seconds at an altitude of 34,000 feet. A total of 110 exposures were made; no comets were recorded.

These photos were intended to augment a ground-based comet search described elsewhere (Courten, H.C., and Ganberg, R.W.: Photographic Search for Comets during 12 November Solar Eclipse, Astron. Jour. 72, page 791(A), 1967. The cameras were rigidly attached to the aircraft, with no means of guidance to offset angular motions of the aircraft, and with no protection from vibration. Eastman Kodak Type 2475 emulsion on 9 $\frac{1}{2}$ -inch-wide Estar base was conformed under vacuum to the curved field of the camera objectives. The longest exposures were 1 second in white light (3900-7000 Å).

A technique for checking the focus setting of a fixed-focus camera was developed. Weather conditions and other camera problems prevented the effective use of this method until after the eclipse. The one camera which was well focused recorded all field stars brighter than magnitude 3.0 with 1/25-second exposures during the eclipse. Short exposures were used to minimize smearing of images caused by rolling of the aircraft. Many exposures were made on roll film with each camera, so that a few might be obtained in the instants when the aircraft was not rolling. Ten percent of the one-second exposures, both in eclipse and on later night flights, were not affected by roll. This demonstrated the validity of the experimental approach. The faintest stars on the later night exposures were of magnitude $V=6^m.74$, according to photometry by H. Guetter at the U.S. Naval Observatory Flagstaff Station. Experiments in composite printing, which may show still fainter stars, have not yet been completed.

Densitometer tracings of star-field exposures indicate that films processed in Morris tanks are unevenly developed. Some form of machine processing is advisable. Longer-focus cameras with the same 12-cm. aperture should be used, with shorter exposures on the same emulsion. This will decrease the limiting magnitude, but the sky background, which limited this attempt, will decrease more rapidly. The best compromise may take a focal length about 50% greater than that used, with exposures of 2/3 of a second. A number of their recommendations based on these experiments are still under discussion.

Support of these experiments by the Atomic Energy Commission (providing window space on the aircraft and camera mountings), is gratefully acknowledged.